

PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project Nez Perce Tribe Resident Fish Substitution Program	
BPA project number	9501300
Contract renewal date (mm/yyyy)	01/1999
Multiple actions? (indicate Yes or No)	No
Business name of agency, institution or organization requesting funding Nez Perce Tribe	
Business acronym (if appropriate)	NPT
Proposal contact person or principal investigator:	
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NPPC Program Measure Number(s) which this project addresses 10.8D.1, 10.8D.2	
FWS/NMFS Biological Opinion Number(s) which this project addresses	
Other planning document references Section 6.6.5.3.B of the Multi-Year Implementation Plan for Resident Fish Protection, Enhancement, and Mitigation in the Columbia River Basin (CBFWA 1997) addresses the need to develop resident fishery opportunities to substitute for anadromous and resident fish losses until these fish impacted by federally licenced and operated facilities are restored.	
Short description Increase fish harvest opportunities to mitigate partially for anadromous and resident fish losses incurred as a result of the construction and operation of Dworshak Dam on the North Fork Clearwater River.	
Target species Multiple Resident Species	

Section 2. Sorting and evaluation

Subbasin Clearwater

Evaluation Process Sort

CBFWA caucus		CBFWA eval. process		ISRP project type	
X one or more caucus		If your project fits either of these processes, X one or both		X one or more categories	
	Anadromous fish	x	Multi-year (milestone-based evaluation)		Watershed councils/model watersheds
x	Resident Fish		Watershed project eval.		Information dissemination
	Wildlife				Operation & maintenance
					New construction
					Research & monitoring
				x	Implementation & mgmt
					Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1997	Completed restoration of the Talmaks Reservoir fishery	Restoration increased carrying capacity, harvest and health of the Talmaks fishery (see objective 2a).
1998	Completed restoration of Mud Springs Reservoir fishery	Effects of restoration on harvest will be assessed in 1999 (see objective 2a).
1998	Identified Cold Springs and Deer Creek fishery sites. Collected environmental and cultural information needed to assess site	Identification two new potential fishery sites for development to mitigate in part for anadromous losses (see

	suitability, develop engineering designs, and compile NEPA documentation	objective 1a).
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Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Develop new resident fisheries within the Nez Perce Reservation to provide 4750 kg of resident fish annually for harvest to mitigate in part for loss of anadromous fishing opportunities.	a	Conduct site feasibility studies. Identify potential sites for development. Collect environmental and cultural information needed to assess site suitability, develop engineering designs, and compile NEPA documentation.
		b	Develop engineering designs and cost estimates in coordination with U.S. Corps of Engineer, that address safety, engineering, as well as specific biological requirements proposed by NPT fisheries biologists.
		c	Compile required environmental impact documentation pursuant to NEPA. Assess potential environmental impacts due to the proposed fishery following NEPA guidelines.
		d	Phase construction of new fisheries in accordance with the site feasibility and design studies. Increase resident fish harvest opportunities on the Nez Perce Reservation to mitigate for loss of anadromous fish due to the construction and operation of Dworshak Dam.
2	Maintain new and existing resident fisheries within the Nez Perce Reservation to provide 4750 kg of resident fish annually to mitigate in part for loss of anadromous fishing opportunities.	a	Implement structural improvement plans and water quality/habitat management action plans at existing fisheries. Increase carrying capacity and harvest potential at Talmaks and Mud Springs Reservoirs.
		b	Monitor temperature, oxygen, depth and other pertinent chemical, biological, and habitat parameters to evaluate water quality and habitat at new fisheries as a result of the completion of Task 2a.

Obj 1,2,3	Objective	Task a,b,c	Task
		c	Monitor and evaluate effects of watershed use on water quality and habitat quantity. Assess fisheries response to land use practices in the watershed and gauge implemented best (grazing, logging and agricultural) management practices (BMPs).
		d	Conduct periodic site maintenance to maintain structural integrity of the dam and habitat quality to maximize potential carrying capacity and fish harvest.
3	Manage new and existing resident fisheries within the Nez Perce Reservation to provide 4750 kg of resident fish annually to mitigate in part for loss of anadromous fishing opportunities.	a	Develop individual fishery management and stocking plans to provide maximum return to harvest based on the existing carrying capacity and environmental conditions/ limitations of the fishery.
		b	Implement fisheries management plans to creating multi-species systems that maximize potential resident fish harvest and reduce the needed for stocking.
		c	Monitor fish growth and condition reflecting health of the fisheries, and harvest.
		d	Evaluate and revise management and stocking plans based on health of the fishery and harvest information (Task 3c) to maximize fish growth, condition, and harvest.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1a	01/1996	on going	Identify new fisheries sites, collected baseline data	1998 - Deer Creek and Cold Springs; 1999 Zenner Meadows	5
1b	01/1998	on going as sites are	Develop engineering designs and cost estimates	1999 - Deer Creek completed;	7.5

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
		identified		Zenner Meadows started	
1c	01/1998	on going as sites are identified	Compile information for NEPA documentation	1999 - Deer Creek EA completed; Zenner Meadow started	7.5
1d	06/1999	on going as 1b and 1c are completed	Construction of new fisheries	1999 - begin Deer Creek construction	60
2a	06/1995	09/1998	Restoration of existing fisheries	1997 - Talmaks completed; 1998 - Mud Springs completed	0
2b	05/1999	on going monthly	Monitor changes in environmental conditions		2
2c	05/1999	on going monthly	Evaluate restoration and need for maintenance		1
2d	01/1995	on going as needed	Site maintenance		2
3a	01/1999	on going at new sites	Development of fish management plans	1999 Talmaks and Mud Springs	2.5
3b	05/1999	on going at new sites	Implementation of plans	1999 Talmaks and Mud Springs	5
3c	05/1995	on going quarterly	Monitor status of fishery		5
3d	05/2000	on going yearly	Evaluate and revise plans		2.5
				Total	100

Schedule constraints

Scheduled development at new sites is dependent on the completion of NEPA permitting requirements, and environmental analyses.

Completion date

If the project goal of providing 4750 kg of resident fish harvest annually is met with the development of the fisheries at Deer Creek, Cold Springs and Zenner Meadows we will complete the development and construction phase of the project.

Section 5. Budget

FY99 project budget (BPA obligated):	\$750,000
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FY2000 budget by line item

Item	Note	% of total	FY2000 (\$)
Personnel	FTEs: 1 Project Leader, 4 Technicians, 0.5 Administrative support	23.5	200,000
Fringe benefits	20 % of personnel costs	4.7	40,000
Supplies, materials, non-expendable property		0.6	5,000
Operations & maintenance	at existing sites (Talmaks and Mud Springs)	2.4	20,000
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	See cost sharing below		
NEPA costs	Collection of environmental data covered in Personnel and Supplies line items. - see subcontracts.		
Construction-related support	for Phase 1 of Deer Creek site construction - see subcontracts		
PIT tags	# of tags:		
Travel		0.3	2,500
Indirect costs	23 %	7.2	61,500
Subcontractor	-Construction of Deer Creek Reservoir and Dam	58.8	500,000
	-Compiling of NEPA documentation by BPA for new fisheries	2.5	21,000
Other			
TOTAL BPA REQUESTED BUDGET			850,000

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount (\$)
Nez Perce Tribe	Land acquisition at proposed Deer Creek site.	11 %	160,000
Nez Perce Tribe	Land acquisition at Zenner Meadows site.	32 %	460,000
Total project cost (including BPA portion)			1,470,000

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	300,000	300,000	300,000	300,000

Section 6. References

Watershed?	Reference
	Brusven, P. 1991. Baseline monitoring and analysis of Talmaks Reservoir and Mud Springs Reservoir. Report to EPA by the Water Resources Division of the Nez Perce Tribe. Grant # S-000498-01-3. Lapwai, ID
	Columbia Basin Fish and Wildlife Authority. 1997. Draft multi-year implementation plan for resident fish protection, enhancement, and mitigation in the Columbia River Basin. CBFWA Tech. Planning Document. Portland, OR
	Cramer S.P., C.W. Huntington, and C.R. Steward.1993. Harvest of Anadromous Fishes Lost by the Nez Perce Indian Tribe as a Result of the Lewiston and Harpster Dams in the Clearwater Basin. S.P. Cramer and Associates, Inc.
	Everhart, W.H. and W.D. Youngs. 1981. Principle of Fishery Science (2 nd ed.). Cornell University Press. Ithaca NY
	Matthews, J.P. 1995a. Talmaks Reservoir: Phase 1 Diagnostic and Feasibility Water Quality Study. Final Report Nez Perce Tribe Water Resources Division. Lapwai, ID.
	Matthews, J.P. 1995b. Mud Springs Reservoir: Phase 1 Diagnostic and Feasibility Water Quality Study. Final Report Nez Perce Tribe Water Resources Division. Lapwai, ID.
	McLarney W. 1987. The Freshwater Aquaculture Book. Hartley and Marks Inc. Point Roberts, WA
	Nielsen, L.A. and D.L. Johnson. 1983. Fisheries Techniques. American Fisheries Society. Bethesda, MD
	Noble, R.L. 1986. Management of reservoir fish communities by influencing species interactions. pages 137-143 in G.E. Hall and M.J. Van Den Avyle, (eds.) Reservoir Fisheries Management: Strategies for the 80's. American Fisheries Society, Bethesda, MD
	Northwest Power Planning Council. 1994. Columbia River Basin Fish and Wildlife Program. Report 94-48. Portland OR
	Ott,L. 1984. An introduction to statistical methods and data analysis. Second Edition. PWS Publishers, Boston MA.

PART II - NARRATIVE

Section 7. Abstract

The Nez Perce Tribe Resident Fish Substitution Program is funded by Bonneville Power Administration pursuant to measures 10.8D.1 and 10.8D2 of the Northwest Power Planning Council's 1995 Fish and Wildlife Program. The construction and operation of hydropower projects in the Columbia River Basin have blocked anadromous fish migration and altered anadromous and resident fish habitat. Both native and anadromous fish have been severely impacted. A priority of the Council's Program is to mitigate for the irretrievable losses in areas permanently blocked to anadromous fish using substitution. The goal of the Resident Fish Substitution Program is to provide 4,000 to 4,750 kg of resident fish annually for harvest to mitigate, in part, for anadromous fish losses due to the construction and operation of Dworshak Dam on the North Fork Clearwater River. The specific objectives of the program as directed by measure 10.8D.2 of the Council's Program are to develop, maintain, and manage trout ponds within the Nez Perce Indian Reservation. Currently, two existing ponds are being maintained and managed using a multi-species ecosystem approach. The goal of ecosystem management is to maximize fish growth and increasing harvest opportunities by creating an equilibrium between predators and prey. A number of new fisheries are also being developed within the Nez Perce Reservation, at Cold Springs, Deer Creek and Zenner Meadows. By 2005 we expect these or other fisheries to meet our annual harvest goal of 4,750 kg of resident fish.

Section 8. Project description

a. Technical and/or scientific background

The Northwest Power Planning Council (Council) estimates that approximately 75 percent of the salmon lost in the Columbia River Basin can be attributed to the hydropower system. Severe reductions and losses of anadromous fish in the North Fork Clearwater River and Clearwater River basins are attributable directly to the construction and operation of Dworshak Dam. In 1971 Dworshak Dam was completed near the mouth of the North Fork Clearwater River eliminating Chinook salmon *Oncorhynchus tshawytscha* and steelhead *O. mykiss* from the North Fork Clearwater River basin. It is estimated that 33 percent of both steelhead and Spring Chinook, and 20 percent of the Fall Chinook salmon production in the Clearwater River basin as a result has been lost (Cramer, Huntington and Steward 1993). These severe losses in the Clearwater River basin system are directly attributable to both the construction and operation of the dam. The dam has severely reduced rearing and spawning habitat both upstream and downstream. Ninety-five percent of the North Fork Clearwater River basin has been blocked and flow and temperature regimes in the lower Clearwater River altered.

The loss of anadromous fish has had a great impact on the Nez Perce people. The Nez Perce have a sacred relationship with salmon. The value of the salmon to the Nez Perce Tribe cannot be fully quantified or adequately characterized. Not only were salmon heavily relied on for subsistence, the economic, social and cultural base of the people evolved around the timing and distribution of the salmon runs. What is distinctive about the Nez Perce people can be directly attributed to their relationship to the salmon. Salmon are still a major component of the Nez Perce culture, yet the remaining salmon stocks are not able to meet current subsistence and traditional needs of the Nez Perce. Due to the paucity of salmon harvest opportunities fishing opportunities for resident fish have become increasingly important. The goal of the Nez Perce Tribe (NPT) Resident Fisheries Substitution Program is to provide up to 4750 kg of resident fish for harvest annually on the reservation. Increasing the availability of resident fish and harvest opportunities will meet, in part, the current subsistence needs of the Nez Perce.

b. Rationale and significance to Regional Programs

The Nez Perce Resident Fisheries Program is part of the Council's resident fish substitution program as authorized by measure 10.8D.1. The objective of the program is to provide consumptive resident fisheries to compensate, in part, for loss of anadromous fisheries opportunities resulting from the construction and operation of Dworshak Dam. To accomplish this, measure 10.8D.2 authorizes BPA to fund the Nez Perce Tribe to:

"Develop, maintain and manage trout ponds within the Nez Perce Reservation including: (1) physically improve, maintain, monitor and stock the two existing trout ponds; (2) identify through site inventory and analysis additional sites suitable for fish pond construction; (3) construct 6 to 12 additional fish ponds, depending on availability of suitable sites; and (4) maintain, monitor and stock the additional fish ponds."

The stocking and management of resident fish in confined reservoir and pond systems can provide fishery opportunities with minimal genetic or competition risk to endemic salmonids. The impacts to resident and anadromous fish populations at proposed fisheries sites are fully evaluated and considered in the analysis of site suitability following NEPA guidelines. The program can also indirectly reduce impacts to native species and endemic salmonids by decreasing fishing pressure.

c. Relationships to other projects

N/A

d. Project history (for ongoing projects)

In 1995 pursuant to the Council's program and supported by BPA the NPT Department of Fisheries Resources Management (DFRM) began developing, maintaining, and managing trout fisheries within the Nez Perce Reservation.

The priority of the program (BPA Project #9501300) was to improve, maintain, monitor, and stock two existing trout ponds on the reservation, Talmaks and Mud Springs Reservoirs. Talmaks and Mud Springs Reservoirs were constructed by the Bureau of Indian Affairs, U.S. Department of the Interior, in 1964. Water quality and habitat problems due to dam deterioration and watershed practices were identified early on. With the U.S. Army Corps of Engineers and the NPT Water Resources Department, plans for pond restoration and watershed improvements were developed and implemented. Both ponds were drained and repairs to the dams (i.e., reinforcement and armoring of spillway, valve/gate repairs, etc.), to the reservoirs (i.e., dredging, construction of sediment basins), and watershed activities (fencing, implementation of Best Management Practices -BMPs, etc.) were completed by 1998.

Both the Talmaks and Mud Springs fisheries originally were maintained as a put-and-take fisheries, primarily by stocking catchable rainbow trout. In 1998, however, we began to develop a multi-species ecosystem approach to maximize potential resident fish harvest and reduce the needed for continual stocking of catchables (Noble 1986). In 1999 environmental conditions that limit fishery success at both Talmaks and Mud Springs Reservoirs were identified. Based on this

information a stocking and management plan designed to maximize and enhance a predator/prey interactions were developed. We hope to implement these plans during the summer of 1999 at Talmaks and Mud Springs Reservoirs. Using an adaptive management approach the effects of introduced predators and prey on the growth and harvest of targeted harvestable species such as trout, bass, sturgeon will be monitored and evaluated (see methods for details).

In 1996 reconnaissance studies to identify and inventory additional sites suitable for resident fisheries were initiated. Additional fisheries are needed to meet our goal to provide a harvest of 4500 kg of resident fish annually. Two potential sites, Cold Springs in the Clearwater River basin and Deer Creek in the Salmon River basin were identified for suitability analysis. Detailed analysis of water quality and quantity, terrain, geology, potential commercial timber losses, the potential reservoir size and depth, biological losses and impacts, site access, land ownership, and watershed uses at these sites were conducted and used to assess suitability. Both the Deer Creek and Cold Springs sites were considered suitable.

In 1998, information needed to complete required NEPA documentation (i.e., legal site description, assessment of site use by resident and anadromous fish and impacts, inventory of cultural resources, etc.), and engineering designs (i.e., mapping of site elevations, site surface hydrology, soil analysis, geology/core analysis, etc.) were collected. The NEPA documentation (sub-contracted to BPA) and the engineering designs (being completed under a cost share contract with the U.S. Corps of Engineers) are expected to be completed in early 1999.

Dam and reservoir construction at the Deer Creek site is scheduled to begin in the spring of 1999. The projected completion date is the fall of 2001. A fisheries management plan specific for the predicted environmental conditions at the Deer Creek site is being developed and will be completed in early 2000. Recently an additional site was identified on Webb Creek in Zenner Meadows. In 1999, further analysis at the Zenner Meadows site will be done to assess its suitability.

e. Proposal objectives

The goal of the NPT Resident Fish Substitution Program is to provide 4,000 to 4,750 kg of resident fish annually for harvest to partially mitigate for anadromous fish losses due to the construction and operation of Dworshak Dam on the North Fork Clearwater River (CBFWA 1997). The specific objectives of the program are to develop, maintain, and manage new and existing resident fisheries within the Nez Perce Reservation to mitigate for these losses (NPPC 1994).

Objective 1: Develop new resident fisheries within the Nez Perce Reservation to provide 4750 kg of resident fish annually for harvest to mitigate in part for loss of anadromous fishing opportunities.

Assumptions: Suitable locations exist within the Nez Perce Reservation for the development of resident fisheries. Resident fisheries can be developed with no impact to native and anadromous fish.

Task 1. Conduct site feasibility/scoping studies.

Product: Identification of potential fisheries. Collection of environmental and cultural information needed to assess site suitability, develop engineering designs, and compile NEPA documentation.

Task 2. Develop engineering designs and cost estimates.

Product: Designs and costs, that address safety, engineering, and biological requirements proposed by DFRM.

Task 3. Compile required environmental impact documentation pursuant to NEPA.

Product: Assessment of potential environmental impacts due to the construction of

Task 4. Phase construction of new fisheries in accordance with the site feasibility and design studies.

Product: Increased resident fish harvest opportunities on the Nez Perce Reservation to mitigate for loss of anadromous fish due to the construction and operation of Dworshak Dam.

Objective 2: Maintain new and existing resident fisheries within the Nez Perce Reservation to provide 4750 kg of resident fish annually to mitigate in part for loss of anadromous fishing opportunities.

Assumptions: Annual harvest at existing and new resident fisheries can be maximized by maintaining existing carrying capacity. Carrying capacity is dependent on quality and quantity of water and habitat. Watershed/ land uses (i.e., grazing, logging, agriculture) affect water quality (i.e., nutrients, temperature, sedimentation, dissolved oxygen) and the habitat quantity (sedimentation delivery rates /depth ratio).

Task 1. Implement structural improvement and water quality/habitat management action plans at Mud Springs and Talmaks Reservoirs.

Product: Increased carrying capacity and harvest potential at Talmaks and Mud Springs Reservoirs.

Task 2. Monitor temperature, oxygen, depth and other pertinent chemical, biological and habitat parameters to evaluate water quality and habitat at new fisheries, and to evaluate restoration at existing sites.

Product: Indication of environmental conditions reflecting carrying capacity.

Task 3. Monitor and evaluate effects of watershed use on water quality and habitat quantity.

Product: Assessment of impacts on fisheries from land use practices in the watershed and gauge to regulate grazing, logging and agricultural practices.

Task 4. Conduct periodic maintenance of the site to maintain structural integrity and habitat quality.

Product: Maximized carrying capacity and harvest.

Objective 3: Manage new and existing resident fisheries within the Nez Perce Reservation to provide 4750 kg of resident fish annually to mitigate in part for loss of anadromous fishing opportunities.

Assumptions: Management techniques can be applied and are successful in maximizing fish growth and harvest. Multi-species of resident fish can be stocked and their interactions (predator/prey) will reduce the overall need for continual stocking and increase harvest of target species (i.e., trout, bass, sturgeon).

Task 1. Develop fisheries management plans to provide maximum return to harvest based on carrying capacity and specific environmental conditions of the fishery.

Product: Plan to maximize fish growth and harvest based on environmental conditions/limits at each site.

Task 2. Implement fisheries management plans.

Product: Multi-species systems that will maximize potential resident fish harvest and reduce the needed for stocking.

Task 3. Monitor fish growth, health of the fisheries, and harvest.

Product: Information needed to evaluate and refine management plans and maximize fish growth and harvest.

Task 4. Evaluate and revise management plans based on growth and harvest information.

Product: A maximization of fish growth, health of the fishery, and harvest.

f. Methods

Development of new resident fisheries within the Nez Perce Reservation.

New sites are identified by compiling information from tribal members, fisheries staff, local landowners, and various land management personnel familiar with local terrain and surface water sources. The suitability of a new site for fishery development is assessed on a number of criteria. Criteria considered include: water quality and quantity, terrain, commercial timber losses, potential reservoir size and depth, biological losses and impacts, access, land ownership, and watershed use. Both the quality and quantity of streams and springs feeding the proposed site are considered. Water temperature below 55° F is preferred, especially for trout fisheries. Quantity of water is rated based both on amount and seasonality of flow.

Maps and field surveys are used to identify suitability of the terrain and geology, amount of acreage inundated, losses of timber, and reservoir depth. Site accessibility and existing access is also identified.

Potential impacts to anadromous and native resident fish populations are fully investigated. The presence of anadromous and native resident fish at the site and potential seasonal use are investigated. Historic tribal and state fishery records are reviewed, if available, and/or sites are surveyed using electro-fishing techniques. Physical barriers preventing migration of anadromous fish into the area are identified. Sites accessible to anadromous fish or populated by native resident fish are considered not suitable for development.

Property ownership and watershed/land use surrounding each of the proposed reservoir sites are also investigated. Landownership records are reviewed and lands owned or in tribal trust are preferred. Private lands that could be acquired or leased constituted the next tiered priority. If the watershed of the proposed development and upstream water sources are in private ownership, land uses and potential impacts are also investigated. Grazing, pasturage and timber harvest are the predominant land uses in most of the watersheds investigated. Sites where current or proposed land use practices could affect the integrity of the proposed fisheries are not considered suitable.

Once a potential site is identified environmental, biological, and cultural information needed to compile required NEPA documentation and develop engineering designs are collected. Dam and reservoir construction at proposed sites follow NEPA guidelines. Engineering designs and cost estimates are developed in coordination with U.S. Corps of Engineers. Dam and reservoir designs address safety as well as specific biological requirements proposed by DFRM.

A number of fisheries are in the process of being developed at Cold Water Springs, Deer Creek and Zenner Meadows by the Nez Perce Tribe. Construction at the Deer Creek site is scheduled for 1999. Additional sites will be considered if existing and propose fisheries do not meet the annual harvest goals.

Maintenance of new and existing resident fisheries within the Nez Perce Reservation.

We assume that 1) annual harvest at existing and new resident fisheries developed can be maximized by maintaining or improving the existing carrying capacity of the system, 2) carrying capacity is dependent on quality and quantity of water and habitat, and 3) that watershed / land uses (i.e., grazing, logging, agriculture) affect water quality (i.e., nutrients, temperature, dissolved oxygen) and the habitat quantity.

Based on these assumptions we have developed and implement structural improvement and water quality/habitat management action plans at Mud Springs and Talmaks Reservoirs (Brusven 1992, Matthews 1995a, 1995b). Water quality and habitat quantity in these reservoirs have been diminished over the years due to dam deterioration and land use practices in the basins. Reservoir and dam restoration (e.g., sediment removal, dike repairs, drain valve modifications) and watershed improvements (fencing, sediment retention facilities, implementation of best management practices, BMPs) have been successful in increasing the volume of habitat and reducing the level of sediment and nutrients transport into the reservoirs.

Monitoring is necessary to determine the water quality response to watershed BMPs and reservoir restoration efforts. Monitoring programs designed to assess restoration activities have been developed for Talmaks and Mud Springs Reservoirs (Matthews 1995a, 1995b). Water quality trend data collected before and after restoration will be used to evaluate success of restoration activities and assess the need for additional maintenance.

Seasonal nutrient and sediment buildup created hypereutrophic conditions in Talmaks Reservoir before restoration and watershed improvements were completed in 1997. Monitoring will be needed to determine whether our goals of reducing nutrient and sediment inflow by 50 percent, eliminating blue-green algae growth, increasing summer secchi disk visibility to an average of 2.25 meters, maintaining a dissolved oxygen concentration ≥ 5.0 mg/l near the bottom of the reservoir, reducing annual phosphorus load that enters the reservoir by 75-90 percent (hypereutrophic and eutrophic limits), and maintaining total phosphorus between 24ug/l and 35 ug/l can be reached (Mathews 1995a).

Restoration at Mud Springs Reservoir was not completed until late 1998. Monitoring and evaluation of environmental data collected during 1999 will be used to evaluate the success of restoration. The water quality of Mud Springs Reservoir was highly degraded and intensive watershed and reservoir restoration were required. Monitoring will be conducted to determine if water quality goals of reducing annual phosphorus loading to the reservoir by 79-90 percent, reducing in reservoir phosphorus concentrations down to 48-24 mg/l/m³, eliminating blue-green algae growth, increasing summer secchi disk visibility to an average of 1.5-2.25 m, and maintaining a dissolved oxygen level concentration ≥ 5.0 mg/l near the bottom of the reservoir have been reached.

The monitoring of environmental conditions and the fisheries (see Objective 3) at Talmaks and Mud Springs Reservoirs will continue to ensure the continued viability of fisheries, and detect changes from BMPs and restoration measures. Sampling at Talmaks and Mud Springs is done bi-monthly between May and October in the main reservoir at the deepest point. Temperature, dissolved oxygen, pH, and conductivity are measured at 0.5 m intervals through the water column and a secchi disk depth is taken. Surface water samples are collected quarterly for the analysis of phosphorous and chlorophyll a. As new fisheries are developed monitoring programs will be developed and implemented based on the designated beneficial uses and identified needs to maintain the fishery.

Management of new and existing resident fisheries within the Nez Perce Reservation.

In the past both Talmaks and Mud Springs were managed as a put-and-take fisheries

primarily by stocking catchable rainbow trout. Although this was successful we found that both reservoirs are highly productive (Mauney et al. 1996, 1997). We feel that with proper management a successful multi-species fisheries can be developed at the Talmaks and Mud Springs sites that will reduce the need and cost involved in stocking a put-and-take fishery.

In early 1999, fisheries management plans will be finalized for Talmaks and Mud Springs Reservoirs. Implementation is scheduled for the spring of 1999, or as resident fish are available. The goal of the fishery management plan is to provide maximum return to harvest using a multi-species approach. Environmental conditions limiting production and harvest will be identified at each site, warm and/or coldwater species best suited for the system identified, and stocked.

Growth, condition, and abundance of fish will be tracked and trend data used to evaluate the success of the plan, or alter the plan as needed. Because of lack of true replication, repeated treatments over the season, or between years, will be used as pseudo-replications to test results. Results will be specific to the system being tested, but may be used to generate further hypotheses for testing in other systems. Temporal, environmental, and biological variations will be considered and an attempt will be made to evaluate their effects on fish growth and harvest.

Fish growth and harvest will be used as the primary measures of the health of the system and success of our program and to evaluate and refine management plans over time. Growth of target species will be monitored quarterly. Lengths and weights of the fish present will be measured from fish sampling (e.g., using trawl, hook-and-line, or gill nets; Nielsen and Johnson 1985, Everhart and Young 1953). Sample size will be estimated and adjusted based on approximated variation in the size classes of fish present at the time of sampling (Ott 1984). Significant changes in pooled weights and lengths between sampling periods will be used to indicate growth (Nielsen and Johnson 1985, Everhart and Young 1953).

Prey species will also be extensively monitored. The size and abundance of non-harvested prey species will be tracked and trend data used help develop a plan to maintain and maximize the forage base. Habitat improvements may be proposed to increase recruitment and densities of prey if considered needed.

Harvest will also be monitored annually. Creel surveys will be conducted to estimate fishing effort and catch per unit effort (CPUE; Nielsen and Johnson 1985). The fishing population will be sampled using a stratified random design. We have found in the past that the majority of fishing at Talmaks and Mud Springs occurs between 10am and 6pm on weekend days (Mauney 1996). Annual harvest will be estimated and used to determine the success of management at the existing and new fisheries, and measure the overall program goal of providing 4750 kg of resident fish annually for harvest on the Nez Perce Reservation.

g. Facilities and equipment

The Resident Fisheries Program personnel are located the NPT Fisheries office in Lapwai, Idaho. The Lapwai Office provides a central location within the Nez Perce Reservation and access to existing and proposed fisheries. The Lapwai Office, in addition to office space provides a fenced compound to secure vehicles and boats. Project vehicles are leased from GSA. Annual costs to operate and maintain GSA vehicles are included in each year budget projection. The project has two aluminum rowboats and snowmobiles (proposed for purchase in 1999) that are used for sampling and access proposed sites in the winter, respectively.

One computer has been leased for the project. Internet and e-mail capabilities are on-line. The computer is equipped with word processing, spreadsheet, data base, statistical and graphic

software. Repair and software updates are provided by Tribal Computer Service. Field equipment for sampling environmental conditions and status of the fisheries (hydrolab, flow meter, transect/level, survey equipment, ice auger, nets, fishing equipment, scales) have also been purchased since 1995.

In addition, sampling gear and equipment are available from other Tribal Projects supported under the BPA Umbrella Agreement with the NPT Department of Fisheries Resources Management.

h. Budget

Budget projections presented in section reflect the costs needed to develop, maintain and manage the existing and new fisheries being developed to provide a harvest of 4750 kg of resident fish annually to mitigate, in part, for losses of anadromous fish.

Personnel/Fringe– Currently the project supports 5 full time employees (1 Project Leader, and 4 Technicians). The Project Leader is responsible for: 1) developing and implementing fisheries management and monitoring plans, 2) identifying maintenance needs and coordinating maintenance activities, 3) identifying and developing of new fisheries, 4) analyzing, interpreting, and reporting data, and 5) developing and writing proposals and budgets. Technicians, under the direct supervision and direction of the Project Leader, are responsible for: 1) sampling and monitoring of the fishery (i.e., the collection of fish data, water quality samples and data, do creel surveys, etc.), 2) perform routine maintenance, and 3) aid in computerizing of data.

Supplies/Materials– Included are costs of general supplies and materials needed to collect fish and environmental data needed to maintain and manage new and existing fisheries. Costs include general office supplies and expendable field sampling materials.

Operation & Maintenance-- Costs of routine maintenance at Talmaks and Mud Springs Reservoirs are included. The majority of these costs are associated with the maintenance and dredging of the sediment retention facilities. Also include are the minimal costs associated with the annual repairs of cattle exclusion fences.

Capital acquisitions or improvements– Land acquisition of at proposed new fisheries is being covered by Tribal funds. With the completion of restoration at Talmaks and Mud Springs Reservoirs in 1997 and 1998 no major improvements at these sites are anticipated in 2000.

NEPA costs– Cost to compile and complete NEPA documentation has been contacted to BPA. We anticipate that in 2000 we will be involved in the assessment of environmental impacts due to the proposed construction of at least one site (possible Zenner Meadows). Costs for the collection of addition data needed to address the existing fisheries, cultural impacts and site descriptions are not included in this line item, but are included under subcontracts.

Construction-related support– We anticipate that in 2000 Deer Creek Reservoir will be under construction. The monies for this construction are listed under sub-contracts.

Travel– Cost in this line item include travel accrued by the project leader and technicians in participating in region meetings and training.

Indirect costs– Indirect costs, or tribal overhead is fixed yearly based on projected tribal administrative and accounting costs. This amount is controlled through an agreement between the Nez Perce Tribe and BPA.

Subcontractors– A large portion the monies allotted subcontracts are associated with the construction of the Deer Creek Reservoir. The majority of the construction at the site will be subcontracted. At this time, without completed plans from the Corps specific contractors and

costs cannot be designated (see also construction related support above). In addition, to the construction at Deer Creek, a number of subcontracts in 2000 will be needed to collect the information needed to complete the NEPA documentation and dam designs at the Zenner Meadows site. These include: Wyatt Engineering (site mapping), Geo-Engineers (core drilling, geology and soils analysis), Cultural Service (cultural inventory), Valley Helicopter (site survey, transportation), etc.

Section 9. Key personnel

PROJECT LEADER- Nez Perce Resident Fisheries Substitution Program

James Mauney

P.O. Box 365, Lapwai, ID 83540
(208) 843-7320

Responsibilities:

The development and implementation of fisheries management and monitoring plans designed to maximize fish growth and harvest at existing and new resident fisheries. Identify maintenance needs and coordinate maintenance activities. Identify and develop of new fisheries. Analyze, interpret, and report data. Develop and write proposals to continue BPA funding and formulate and oversee expenditure of yearly budget.

Education:

North Carolina State University/Raleigh - B.S. Fisheries 1992
North Carolina State University/Raleigh - M.S. Animal Ecology 1969

Certifications:

Certified Fisheries Scientist (American Fisheries Society)

Experience:

1987-1995 Fisheries Management Biologist, Nez Perce Tribe, Department of Fisheries Resources Management. Lapwai, ID Assured the biologically sound harvest of anadromous fish within the Nez Perce Reservation, ceded lands, and usual and accustomed fishing areas of the Nez Perce.

1967-1987 Fisheries Biologist, Alaska Department of Fish and Game. Juneau. AK Supervised the operation of vessels and fishing operations. Collected and analyzed data. Documented fish runs and impacts due to construction of pipeline and dams.

1965-1967 Fisheries Biologist, State of Maryland, Annapolis, MD. Management of striped bass and estuarine fisheries in Chesapeake Bay. Evaluated artificial reefs and shellfish.

Section 10. Information/technology transfer

Information on project status and the fisheries will be analyzed and presented in quarterly and annual reports to BPA. Data resulting from our multi-species ecosystem approach of management will be presented regionally if results are considered significant and of interest to other regional managers. We will continue to participate in regional BPA reviews.

Congratulations!